

# Can Defining Levels of VV&A Help Joint Programs

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# Agenda

- **Definition:** What do we mean by “levels of VV&A?”
- **Reason:** Why create levels of VV&A?
- **Criteria:** What should we base our levels on?
- **Obstacles:** Where do the levels fall short?
- **Suggestions:** Level areas

# What are levels of VV&A?

## **level *n*.**

- 1.** Relative position or rank on a scale: *the local level of government; studying at the graduate level.*
- 2.** A relative degree, as of achievement, intensity, or concentration: *an unsafe level of toxicity; a high level of frustration.*
- 3.** A natural or proper position, place, or stage: *I finally found my own level in the business world.*
- 4.** Position along a vertical axis; height or depth: *a platform at knee level.*

# What are levels of VV&A?

## **class *n*.**

**1.** A set, collection, group, or configuration containing members regarded as having certain attributes or traits in common; a kind or category.

**2.** A division based on quality, rank, or grade, as:

A grade of mail: *a package sent third class*.

A quality of accommodation on public transport: *tourist class*.

*Biology*. A taxonomic category ranking below a phylum or division and above an order.

*Statistics*. An interval in a frequency distribution.

*Linguistics*. A group of words belonging to the same grammatical

# What are levels of VV&A?

- Each level would contain a class of VV&A activities that are at the same quality, rank, or grade
- The sum total of all VV&A levels would span the entire spectrum of VV&A classes
- Each level of VV&A would indicate its rank or position in the ordered set of VV&A classes

# Why create levels of VV&A?

- Main application comes from the re-use of a model or simulation
- Allows subsequent users **clear understanding** of previous VV&A efforts
  - Aids in M&S selection process
  - Aids in estimation of new VV&A effort
  - Aid cross-program and -service communication
- Allows for long term planning of long term, piecewise VV&A strategy

# What should we base our levels on?

- Need to treat each of the three separate processes (verification, validation, and accreditation) separately
- Goal is to identify and manage risks in applying M&S to a problem, so levels should reflect known levels of risk

# What should we base our levels on?

- What others have suggested
  - Crusader methodology seen yesterday based on level of data validation
  - NASA risk assessment methodology applies weighted average method
  - Climb based on level of M&S abstraction
  - V&V Triangle based on depth and breath of M&S V&V activities



# What should we base our levels on?

- Some factors to consider
  - Level of requirements traceability
  - Level of documentation
  - Level of adherence to standards
  - Level of management control
  - Level of operator training

# Where do the levels fall short?

- VV&A is a function of the intended use, or application
- M&S uses cannot be ranked against one another

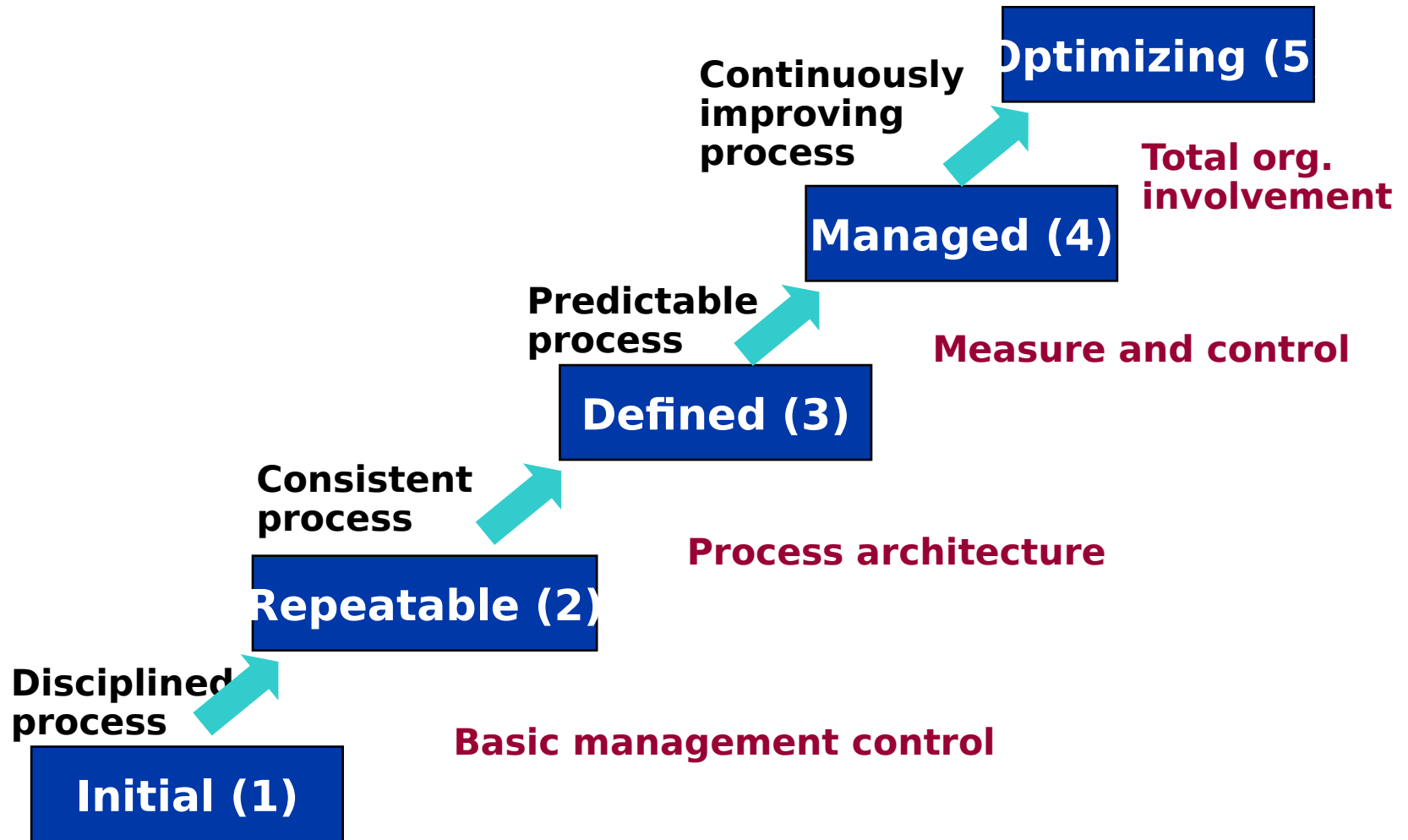
# Where do the levels fall short?

- Levels can mislead potential users
  - The higher the level the better
  - If its at a high enough level, then no additional effort is needed

# Suggestions

- Apply a collection of levels dedicated to single qualities
- Report these levels separately
- Adopt existing structures wherever possible

# Suggestions



Identify M&S Management Process  
Level

# Suggestions

Level	Characteristics
1	No formal documentation
2	Partial Documentation
3	Full documentation
4	Full and automated documentation

Define Full and Partial M&S  
Documentation Sets

# Suggestions

- Define levels of M&S adherence to known standards
  - Architecture standards (i.E. HLA)
  - Coding standards
  - Data standards

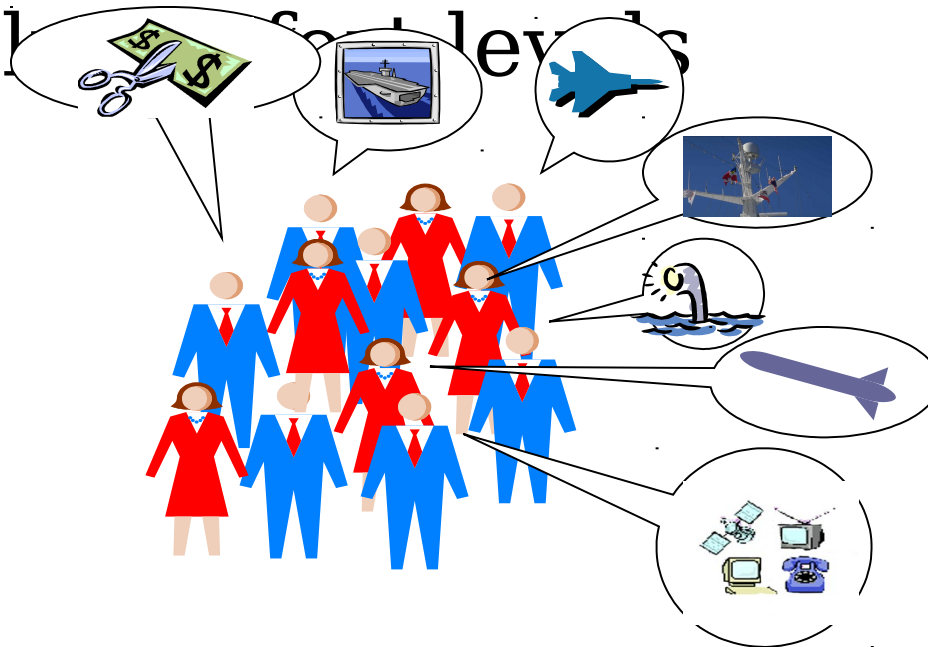
# Suggestions

- Define levels of M&S operator expertise
  - Years of experience
  - Subject area mastery
  - Education levels



# Suggestions

- Do not include risk assessment in levels, as risks are a function of user need, resources, schedule, and risk cost levels



# Please Phone In!

- Navy VV&A Program is seeking to gather information on this topic
- Send in your opinion/information /suggestions

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